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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/814,693	03/15/2001	Kimio Tatsuno	NIT-272	4307

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MATTINGLY, STANGER & MALUR, P.C.
1800 DIAGONAL ROAD
SUITE 370
ALEXANDRIA, VA 22314

EXAMINER	
NGUYEN, CHAU M	

ART UNIT	PAPER NUMBER
2633	8

DATE MAILED: 03/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/814,693	TATSUNO ET AL.	
	Examiner	Art Unit	
	Chau M Nguyen	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to the Request filed on 12 February 2004.

2. The Office acknowledge the Request of the applicant, and the U.S. Patent No. 4,790,634 is also attached.

3. The previous rejection is still maintained as below.

Drawings

4. Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Duplicate Claims

5. Claim 11 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 5. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. The term "the highest transmittance" in claim 7 is a relative term which renders the claim indefinite. The term " the highest transmittance " is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 (b) that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Hori (U.S. Pat. No. 4,821,273).

As claim 1, Hori discloses (Fig. 5) (col. 7, lines 34-50) an optical-fiber communication equipment comprising, a laser light source (denoted by numerical reference 1), a means (lens – located next to laser) for changing light of the laser light source to a parallel plane wave to form a parallel light path, a wavelength selection means having two or more transmission bands, and a first and a second light detector, wherein:

said wavelength selection means (38) is located in the parallel light path;

the parallel plane wave is divided (17 and 18) into at least two pieces of light including light that is transmitted through said wavelength selection means and light passing through a medium having optical characteristics different from those of the light that is transmitted through said wavelength selection means;

the first light detecting means (40) detects one divided piece of light and the second light detecting means (20) detects the other divided piece of light;

signals based on photocurrents from the first and the second light detector are compared to each other to obtain a signal for setting an emitting wavelength of the laser light source to a desired value (col. 6, lines 31-34); and

said signal is used for controlling a wavelength of the laser light source (col. 5, lines 61-65).

10. Claims 1, 3, 4, 6, 8, 9, 12, 14 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Tei et al. (Hereinafter "Tei") (U.S. Pat. No. 6,144,025).

As claims 1 and 6, Tei discloses (Fig. 1) (col. 3, line 42 - col. 4, line 17) an optical-fiber communication equipment comprising, a laser light source (denoted by numerical reference 1), a means (lens - denoted by numerical reference 3) for changing light of the laser light source to a parallel plane wave to form a parallel light path, a wavelength selection means having two or more transmission bands, and a first and a second light detector, wherein:

said wavelength selection means (8) is located in the parallel light path;

said optical system for dividing the parallel plane wave (5) divides the parallel plane wave into at least two pieces of light including light that is transmitted through said wavelength selection means and light passing through a medium having optical characteristics different from those of the light that is transmitted through said wavelength selection means;

the first light detecting means (PD1) detects one divided piece of light and the second light detecting means (PD2) detects the other divided piece of light;

signals from the first and the second light detector are compared (S5 – fig. 16) to each other to obtain a signal (S6) for setting an emitting wavelength of the laser light source to desired value; and

said signal is used for controlling a wavelength of the laser light source so that the wavelength is kept to be a given wavelength (Abstract).

As claims 3 and 8, Tei discloses said wavelength selection means is a Fabry-Perot type etalon constructed of two or more kinds of materials, which differs each other in at least one of temperature characteristics and a refractive index (Fig. 9a, col. 7, lines 28-30).

As claims 4 and 9, Tei discloses a thickness of said Fabry Perot type etalon, which depends on a channel grid interval of wavelength division multiplexing optical-fiber communication (Tei, equations (1) & (2), col. 1, lines 15-21), and thereby

temperature characteristics of transmission characteristics of the Fabry Perot type etalon is compensated (Tei, col. 10, lines 23-28).

As claim 12, Tei discloses an Optical-fiber communication equipment (Fig. 1) comprising, a laser light source, a means (lens – denoted by numerical reference 3) for changing light of the laser light source to a parallel plane wave to form a parallel light path, an optical system for dividing the parallel plane wave, a wavelength selection means, and a first and a second light detector, wherein:

said wavelength selection means (8) is located in the parallel light path;

said laser light source (1) is a laser light source that is capable of lasing at a plurality of lasing wavelengths (col. 1, lines 15-19);

said wavelength selection means has a plurality of light transmission portions having desired wavelengths existing at given wavelength intervals (col. 4, lines 57-60) (equations (1) and (2), col. 7);

the wavelength interval of the light transmission portions is equivalent to a channel grid interval of wavelength division multiplexing optical-fiber communication (col. 1, lines 15-21);

any one of said plurality of lasing wavelengths of the laser light source is equivalent to an emitting wavelength corresponding to a desired wavelength that is shifted to a wavelength portion having the highest transmittance among said plurality of light transmission portions provided by the wavelength selection means (col. 6, lines 16-22 and Fig. 5);

said optical system for dividing the parallel plane wave divides the parallel plane wave into at least two pieces of light including light that is transmitted through said wavelength selection means and light passing through a medium having optical characteristics different from those of the light that is transmitted through said wavelength selection means (see Fig. 1);

signals based on photocurrents from the first and the second light detector, which received each of said divided pieces of light, are compared (S5 – Fig. 16) to each other to obtain a signal (S6 – Fig. 16) for setting an emitting wavelength of the laser light source to a desired value; and

said signal is used for controlling each of said plurality of lasing wavelengths provided by the laser light source so that each lasing wavelength is kept to be a given wavelength. (Abstract)

As claim 14, Tei also discloses said wavelength selection means is a Fabry Perot type etalon constructed of two or more kinds of materials (Fig. 9), which differs each other in at least one of temperature characteristics and a refractive index (col. 7, lines 28-29).

As claim 15, Tei discloses a thickness of said Fabry Perot type etalon, which depends on a channel grid interval of wavelength division multiplexing optical-fiber communication (Tei, col. 1, lines 15-21 and equations (1) & (2) – col. 7), and thereby

temperature characteristics of transmission characteristics of the Fabry Perot type etalon is compensated (Tei, col. 10, lines 23-28).

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 (e) that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims 1 and 4 are rejected under 35 U.S.C. 102(e) as being anticipated by Volz et al. (Hereinafter "Volz") (U.S. Pat. No. 6,501,773).

As claim 1, Volz discloses an optical-fiber communication equipment (Fig. 8B) comprising, a laser light source (832), a means (lens-detailed in Fig. 1B) (Abstract. Line 4) for changing light of the laser light source to a parallel plane wave to form a parallel light path, a wavelength selection means having two or more transmission bands, and a first and a second light detector, wherein:

said wavelength selection means (Etalon, denoted by numerical reference 840) is located in the parallel light path;

the parallel plane wave is divided into at least two pieces of light (denoted by "Beam Splitter" block, Fig. 8B – Detailed in Fig. 1B) including light that is transmitted through said wavelength selection means and light passing through a medium having

optical characteristics different from those of the light that is transmitted through said wavelength selection means;

the first light detecting means (836) detects one divided piece of light and the second light detecting means (838) detects the other divided piece of light;

signals based on photocurrents from the first and the second light detector are compared to each other to obtain a signal for setting an emitting wavelength of the laser light source to a desired value (col. 6, line 66 – col. 7, line 7); and

said signal is used for controlling a wavelength of the laser light source (Abstract, line 5-7).

As claim 4, Volz discloses a thickness of said Fabry Perot type etalon, which depends on a channel grid interval of wavelength division multiplexing optical-fiber communication, is set to a value that is shifted from a free spectral range of the Fabry Perot type etalon (col. 9, lines 24-27), and thereby temperature characteristics of transmission characteristics of the Fabry Perot type etalon is compensated (col. 1, lines 62-65).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. Claims 2, 7 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tei as applied in the claims 1, 6 and 12 above, in view of Miller et al. (Hereinafter "Miller") (U.S. Pat. No. 4,790,634).

As claims 2, 7 and 13, Tei discloses an optical communication equipment as described in the above section including a wavelength selection means is a Fabry-Perot type etalon in which:

a refractive index of its medium is within a range of 1.0 to 4.0 (col. 7, lines 58-60);

a thickness of the medium is set so that a plurality of light transmission portions are generated at given wavelength intervals (col. 7, line 65 - col. 8, line 9), and that any one of the plurality of light transmission portions is equivalent to an emitting wavelength desired by the laser light source.

Tei does not clearly show the surface reflectivities of both reflection planes of the medium are within a range of 20 to 70%. However, Miller shows a medium of Fabry-Perot etalon that having the reflectivity of 70% (col. 4, lines 15-18).

Therefore, it would have been obvious to one of ordinary skill in the art to apply a surface reflectivities on both reflection planes with the range that taught by Miller into the system of Tei in order to create an optical communication system that has abilities to support entirely the emitted wavelengths of laser source and to obtain the reflected light at a desired intensity with a low cost (Miller, col. 2, lines 23-24) since the low reflectivities of the device.

15. Claims 5, 11 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tei as applied to claims 1and 12 above, in view of Watterson et al. (Hereinafter "Watterson") (U.S. Pat. No. 6,526,079 B1).

As claims 5, 11 and 17, Tei discloses an optical-fiber communication equipment (Fig. 1). Tei differs from the claims 5, 11 and 17 of the present invention in that, Hori does not show:

said laser light source is located at a position that is shifted from an optical axis of the means for changing light of the laser light source to a parallel plane wave to form a parallel light path; or a normal line of an incident end face for said wavelength selection means or the laser-light dividing means is located so that the normal line crosses the optical axis of the means for changing light of the laser light source to a parallel plane wave to form a parallel light path.

However, Watterson discloses an arrangement of the optical system wherein, the light source (13) is located at a position that is shifted from an optical axis of the means for changing light of the laser light source to a parallel plane wave to form a parallel light path (See Watterson Fig. 5); or a normal line of an incident end face for said wavelength selection means (18) or the laser-light dividing means (26) is located so that the normal line crosses the optical axis of the means for changing light of the laser light source to a parallel plane wave to form a parallel light path (col. 4, lines 25-36). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to do this

since the arrangement as taught by Watterson would directed the reflected light to focus on another point but not on the laser source. If such the arrangement is introduced into the system of Tei, then the reflected light would be prevented to return back to the laser source which constitutes interferences and/or fluctuations of a laser output. Further, this setting provides tunability of the predetermined wavelength by adjusting the angle of the wavelength selection means (Watterson, col., 4, lines 53-60).

16. Claims 10 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tei (U.S. Pat. No. 6,144,025) as applied in the claims 6 and 12 above, in view of Volz (U.S. Pat. No. 6,501,773).

As claims 10 and 16, Tei discloses an optical communication as described in the above section in that, Tei fails to teach an information storing portion for storing temperature characteristics of a light transmission portion of the wavelength selection means; and

According to a signal from the temperature detecting means and said stored temperature characteristics of light transmission portion of the wavelength selection means, a shift of an emitting wavelength of the laser light source from a channel grid wavelength of said wavelength division multiplexing optical-fiber communication is compensated.

However, Volz discloses an information storing portion (col. 7, lines 29-30), and said laser light source comprises a temperature detecting means (854, Fig. 8C),

wherein the information storing portion stores temperature characteristics of a light transmission portion of the wavelength selection means (col.7, lines 26-29); and

According to a signal from the temperature detecting means and said stored temperature characteristics of light transmission portion of the wavelength selection means, a shift of an emitting wavelength of the laser light source from a channel grid wavelength of said wavelength division multiplexing optical-fiber communication is compensated (col. 1, lines 61-66).

Therefore, as both Tei and Volz are in the same field of optical communication, it would have been obvious to one of ordinary skill in the art at the time of the invention to employed a storing means for storing the temperature characteristics as taught by Volz into the optical system of Tei in order to store the temperature information. One would have motivated for doing this since with the storing information, the system in which the wavelength and power of the transmitted light would be easier in monitoring and controlling without significant interruption of the light. Further, wavelength locking mechanism may be costly (Volz, col. 2, lines 5-8).

Reference Cited

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Tei et al. (U.S. Pat. No. 6,122,301) is cited to show the apparatus for a laser light source.

Vujkovic-Cvijin et al. (U.S. Pat. No. 6,631,019 B1) is cited to show a reconfigurable multichannel transmitter.

Munks (U.S. Pat. No. 6,587,214 B1) is cited to show an optical power and wavelength monitor.

Shevy et al. (U.S. Pat. No. 6,483,956) is cited to show a fiber frequency locker.

Chang-Hasnain et al. (U.S. Pat. No. 6,233,263 B1) is cited to show a monitoring and control assembly for wavelength stabilized optical system.

Munks et al. (U.S. Pat. No. 6,353,623 B1) is cited to show temperature-corrected wavelength monitoring and control apparatus.

Conclusion

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chau M Nguyen whose telephone number is 703-305-8965. The examiner can normally be reached on Mon-Fri from 8:00 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703-305-4726. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

C.M.N.

Feb. 25, 2004

Leslie Pascal

LESLIE PASCAL
PRIMARY EXAMINER